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Domestication changes the vocal expression of emotional arousal toward humans in the red fox *Vulpes vulpes*

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Formerly we found that the farm red foxes, directionally selected for tame or aggressive behaviour toward humans, use distinctive vocal sets in the human-related context. In this study we compared vocal responses of adult female farm foxes: 25 "tame", 25 "aggressive" and 25 unselected for behaviour, representing a "wild" model of vocal behaviour. Acoustic recordings were made during 10-minute tests (one per fox), each including five 2-minute steps, with increasing human activity (pressure) from the first to the third step and decreasing - from the third to the fifth step. During the first step, the experimenter stayed unmoved 0.5 m before a focal fox cage; during the second - she moved by arm or by body right- left and left-right without approach; during the third - approached and arm to a cage and touched a door. The fourth step was equal to the second one, and the fifth - to the first one. For each fox within each test step we measured the calling rate, the degree of vocal activity (calculated as ratio of total duration of all calls to the duration of the step), and, for the "poured" call within a step (received by removal of intercall intervals) - the maximum amplitude frequency and three quartiles, showing 25 %, 50 % and 75 % of the "poured" call energy.

In "wild" foxes, the increase of the experimenter human activity resulted in enhanced emotional arousal, reflected in the higher calling rate, degree of vocal activity and values of all the three quartiles, and decrease of the experimenter activity in decrease of arousal, with the respective decrease in all the vocal parameter values. The "aggressive" foxes showed a very similar pattern, whereas the "tame" - a strongly distinctive pattern. In "tame" foxes, the maximum parameter values occurred when the experimenter appeared before a cage, with the steady decrease of the values throughout a test. Thus, the "aggressive" foxes copied the dynamic of emotional arousal inherent in the "wild" foxes, whereas in the "tame" foxes the fact of a human appearance *per se* evoked the maximum emotional arousal, and the all further human actions have weakly affected to vocal behaviour.

The data are consistent with former data, received in 2005 with other 75 subject foxes, 25 per each selection group and with different experimental design. In general, the results suggest that the red fox vocal behaviour is genetically determined.

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